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J. King Gordon
Editor

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Views from Developing Countries

Jorge Sabato, Bariloche Foundation

I am not, in fact, going to present the views of the developing countries, which have been formally articulated, but my own views on the subject of science and technology for development. I have been working in developing countries for many years and keep working there despite all my traveling, which is due more to political circumstances than to choice of climates, although I do have some preference for the sun. In presenting my views I am going to divide what I have to say into two parts: first, I will try to show where we are in this debate on science and technology, and, second, I will look ahead and try to see where we will go from here. With respect to where we are now, my purpose is not to analyze all that has happened in the last 10–15 years — that would take much more time than is allotted to me. What I shall do is describe some of the many changes that have taken place during this time on two fronts, the academic and the political. The changes are interconnected, but I think it is useful to examine them separately. I shall begin with the academic front.

We now have a good understanding of what is meant by "technological dependence." The concept did not exist 15 years ago, but now there is a considerable body of knowledge on the subject. Of course, the problem needs more research, but the important thing is that it is now an academic issue and its study has produced a number of results.

The second change in some measure is a result of all the research that has been undertaken: we are now more conscious of the cultural alienation caused by importing foreign technology. In 1963, for example, at the time of the last United Nations conference on this subject, it was supposed that technology was more or less neutral and not value-laden. Now we know better. When a country is importing technology or machinery it is importing the values of the society in which the technology was produced. The result is that the importing country's values are modified accordingly, for good or bad.

The third issue that has been clarified is the commerce of technology. Fifteen years ago everybody was talking about the transfer of technology as if it were a free good that could be spread throughout the world through the exercise of goodwill. Almost completely ignored was the fact that technology is a matter of big business: billions of dollars are transferred every year just in technology or technological goods. The commerce of technology is an aspect of international trade that has been studied very thoroughly in the last few years. As a consequence, we now have knowledge and a code of conduct that is being discussed among developing countries, transnational corporations, and developed countries in an effort to organize a commerce of technology on better

terms, more honest terms I would say, than have been used for many years.

Another issue now under revision is the question of industrial property and the patent system. There have been important academic advances in the examination of what is a patent and what is the purpose of the patent system.

Another interesting issue that is new in a sense concerns the problems of companies that are highly specialized in the production of technology and the role of technology as one of the main assets of these companies. We now understand that transnational corporations not only have money and power and tradition and experience, but also technology, which they use as one of the elements of power.

All of this makes us understand that the relation of science and technology to society is much more complex than we imagined a few years ago. And this leads us to a question we have been putting forward in our academic approaches: Science and technology for whom? Previously it was accepted that science and technology was for everybody, and that everybody was the same kind of human being. But we are not all the same kind of human being; we are not all equal members of a family. Some are more equal than others. There are some rich countries and some poor countries, but before that there were rich people and poor people and a lot of the science and technology has been for the rich — not only the rich countries, but also the rich people of the poor countries, who are the worst kind of rich people. The same may be said of global budgets for research and development, which are shared inequitably, or of budgets in general when, for example, one country's budget of $20 billion is divided so that $14 billion goes into weapons. This problem has nothing to do with human beings; it has something to do with a very specific aspect of political power. If we learn that 2% of the gross national product is dedicated to research and development we still have to ask: For whom and for what?

Lastly, it is important to note a victory on the academic front in that the academic studies behind much of this new research have been done by scholars in the Third World. This is proof that developing countries are capable of producing original knowledge in a special field. Many of the ideas now being discussed about the problems of science and technology for development have been produced by scholars and intellectuals in Third World countries.

On the political front the following are the most important issues now under discussion:

- First, as mentioned by Guy Gresford, science and technology are very important components of the New International Economic Order. At the same time, they have become important components of national politics all over the world. Science and technology are topics in the rhetoric of government, and in many cases they are important in institutions, in law, in administration, and so on.

- Second, scientists and technologists are now conscious of the political dimensions of these problems. We have lost our virginity. We now understand that these are political matters, not simple questions of science and technology in the old sense of the words.

If we take the two fronts, academic and political, we can summarize the present situation in the following way: first, the North is now conscious that in the South there exists a capability to think, a capability to grasp the issues under discussion. At the same time, we in the South have become conscious that we are capable of thinking in our own terms. We have also discovered that we have some friends in the North, some allies, and that we have some very important

and dangerous enemies in the South. Being better able to distinguish between enemies and allies is an important political advantage.

• Third, in spite of the fact that we have been acquiring a lot of understanding of the issues and the problems, the real gap between the developed world and the developing world in terms of science and technology and their products has been widening, and at an accelerated pace.

• Fourth, despite all the talk of cooperation between South and North, and despite the special session of the UN General Assembly, the results have been meager, a demonstration that we are good at declarations, but not so good at action.

From this summary I see two issues for discussion in considering the future: How is cooperation among the countries in the South going to improve, or how can we pass from talk to action? And how is the South going to keep negotiating with the North?

It is important to distinguish between cooperation among the countries of the South and the permanent conflict with the North. For many years we have been talking about all being brothers and sisters, North and South. Therefore, cooperation has been the key word for relations between one part of the world and any other part. Now we have realized after all these years and all this experience — and it's a good thing, a healthy thing — that the differences between North and South are so big that cooperation is practically impossible except on marginal issues. But negotiation of conflicts is very important. Once you understand that, you feel better because you are not going to talk in general terms, but are going to talk business, discussing issues that are of real value to both parties.

I don't have a crystal ball and my view may be partial and possibly wrong, but I shall try to look into the future and predict what will happen.

On the academic front the issue is very complex, and despite all the research that is being done, all the conferences and seminars, I have a feeling that we are just scratching the surface. For example, I think we must reappraise the role of basic science because this is going up and down. In 1963, basic science was the key, but in 1979 it has practically disappeared. This could be bad for the South. We need to do a lot of study and try to go deeper. There are three positions on basic science that I have encountered in developing countries that could have serious effects on our technological development and self-reliance: Science ought to be practical rather than theoretical; it ought to be national rather than universal; and it ought to be applied rather than pure. In some countries the approach has become a kind of religion. As a reaction to the so-called ivory-tower attitude of the past, the pendulum has swung far to the other side. We must work for a better balance and avoid superficial judgments.

We need to have a better understanding of the relation between technology and philosophy. Technology is an animal we have discovered in the past 10 years or so, and we don't have a good understanding of its true nature. We need to analyze the relations of ontology, ethics, and epistemology to technology. Some of you may ask why I am interested in spending time, money, and effort in trying to understand the relations between technology and ethics when there are so many people starving in the world. If you are not able to answer that simple question, you will be in trouble trying to understand the game.

We also need to have a better understanding of the relations between technology and economics. At present, we are playing a lot with ideas that are very important, such as basic needs: How do we fulfill the basic needs of human beings or of countries? What kind of technology is related to basic needs? But

Information exchange and cooperation is one objective of the intercropping projects supported by IDRC at the International Rice Research Institute, Manila.

our knowledge about the kind of technology that is related to the economy of a society is not very advanced.

These are some of the academic topics that are of importance. I chose them to give you an idea of the wide scope of these delicate issues, the knowledge of which is scarce.

There is one more topic that merits study: the relation between technology and history, particularly the history of countries and civilizations that are not occidental, although they may have been included in occidental histories. In spite of the great amount written, a lot has been ignored, because knowledge is produced only when you ask the right questions. Now we have new questions for the same old problems. New questions provide new answers, and new answers will give us a better understanding than we have now.

Turning to the political front, I believe that the most important thing is to do everything possible to build up strong infrastructures of science and technology in developing countries. There may be very few people, but it is important to achieve as high a quality as possible, and to preserve and strengthen that quality. I think we need to develop a new kind of mentality in developing countries with respect to science and technology; we must take the offensive.

We have been defensive in the last few years. We have been learning a lot about how to debate, how to protect ourselves, how to control, for example, the importation of technology, and how to control transnational corporations so that they will not cheat us as they used to do. We spent a lot of time and money and effort in a defensive attitude. Why we did so is understandable, but with a permanently defensive attitude you never win. Eventually the other fellow finds a way to get through. I think it is very important to change our mentality and to build up the capacity to produce technology and the understanding of the production of technology.

At Instituto Interamericano de Ciencias Agricolas (IICA), a project is under way to create an information centre on rural youth programs in Latin America.

In our countries, it is important to incorporate science and technology issues into the values of our societies. As it is, science and technology are isolated: they are referred to about once a year in the rhetoric of an anniversary speech or the dedication of a building or a speech at the United Nations. This, of course, is not only insufficient but also detrimental because we do not produce any change in the fabric of society, and change is essential if we are to go on. We need to develop new political instruments that articulate what we are doing in science and technology with what we are doing in the rest of society: in education, in the economy, in health care, and in other activities.

There are a number of critical areas where some degree of cooperation can be established if we are brave enough to go ahead and do it. We need to overcome cultural alienation again. Although the Group of 77 officially abhors the values of the North, they must in many instances seek assistance from foreign corporations and foreign governments. There are a number of issues that have been termed universal or global problems in which North–South cooperation is possible because there are no losers: everyone stands to gain. Earthquake detection is one example. Earthquakes are universal, and there is a legitimate basis for cooperation in their detection. It is important to begin to cooperate in the solution of such problems not only for that end, but also to create a new relationship between the governments and people involved in these problems.

And, finally, there is another kind of cooperation between South and North that I consider important: cooperation in academic research. I know that it has been said many times that such research is apt to perpetuate the colonial tradition because Northern researchers may be superior to Southern and are apt to dominate the latter, but the lesson of experience has been quite different. During the past 5 or 10 years the South's early dependence has been overcome; we are discovering much more independence in the mentality and the way of acting of

the people from the South who are training in the North. Programs can be set up involving legitimate cooperation and full sharing of the two groups, without any patronizing by the Northern researchers.

It is fitting for me to end this presentation on the values of academic cooperation by reminding you that IDRC, a Northern institution, has contributed heavily to many of the advances in the South on the academic front and that this has been possible, in my opinion, because the cooperation was presented in terms of fair play. We in the South recognize that many of the things we did on the academic front that now have important political consequences were in part a result of the cooperation we got from IDRC.

Jorge Sabato is Research Professor, Bariloche Foundation, Buenos Aires, Argentina.